

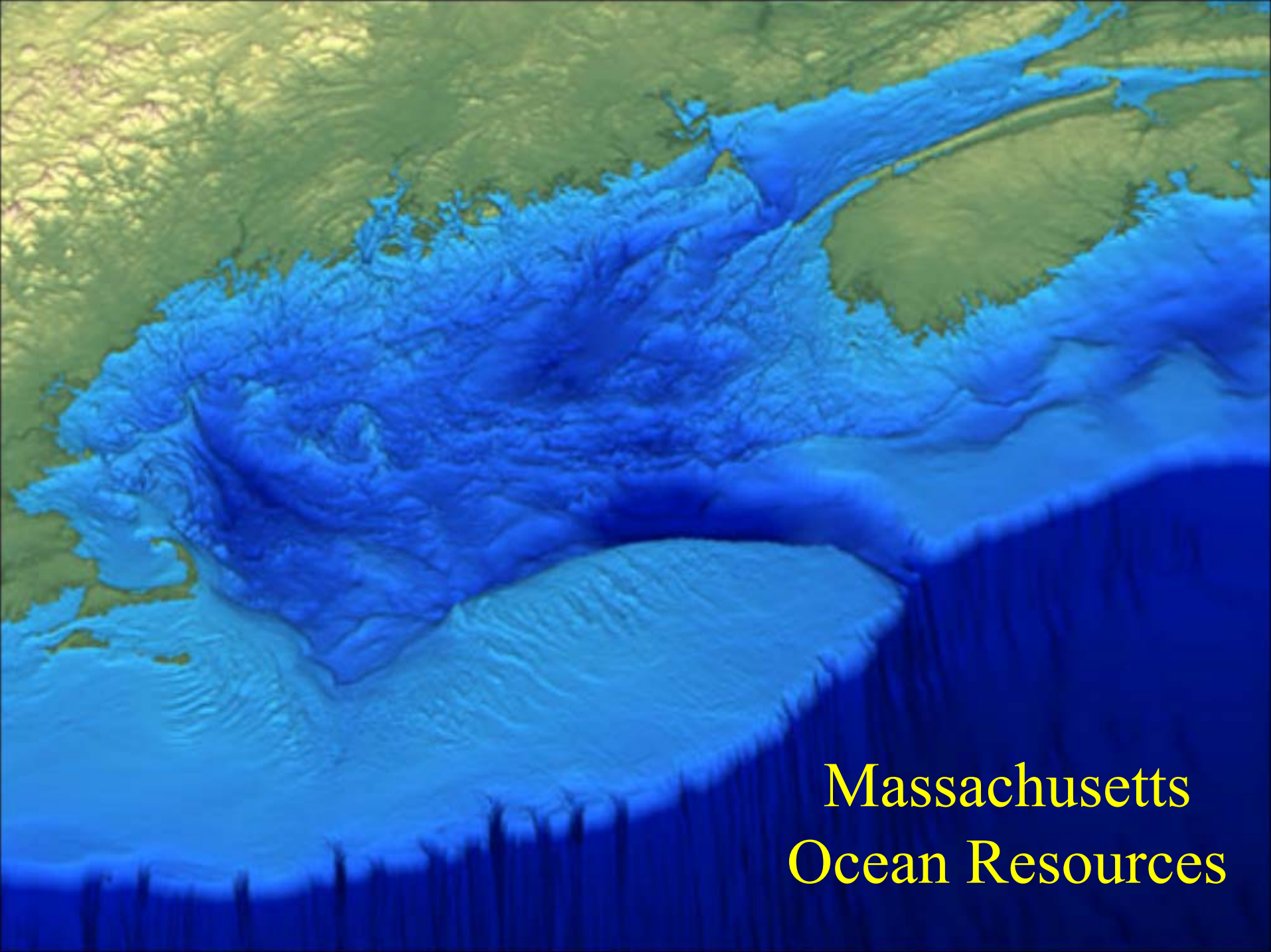
The background of the slide is a stylized, light-colored map of the state of Massachusetts, showing its coastline and major water bodies. The map is rendered in a pale yellow or cream color, contrasting with the light blue background of the slide.

Characterization and Status of Massachusetts Ocean Resources Ocean Environment

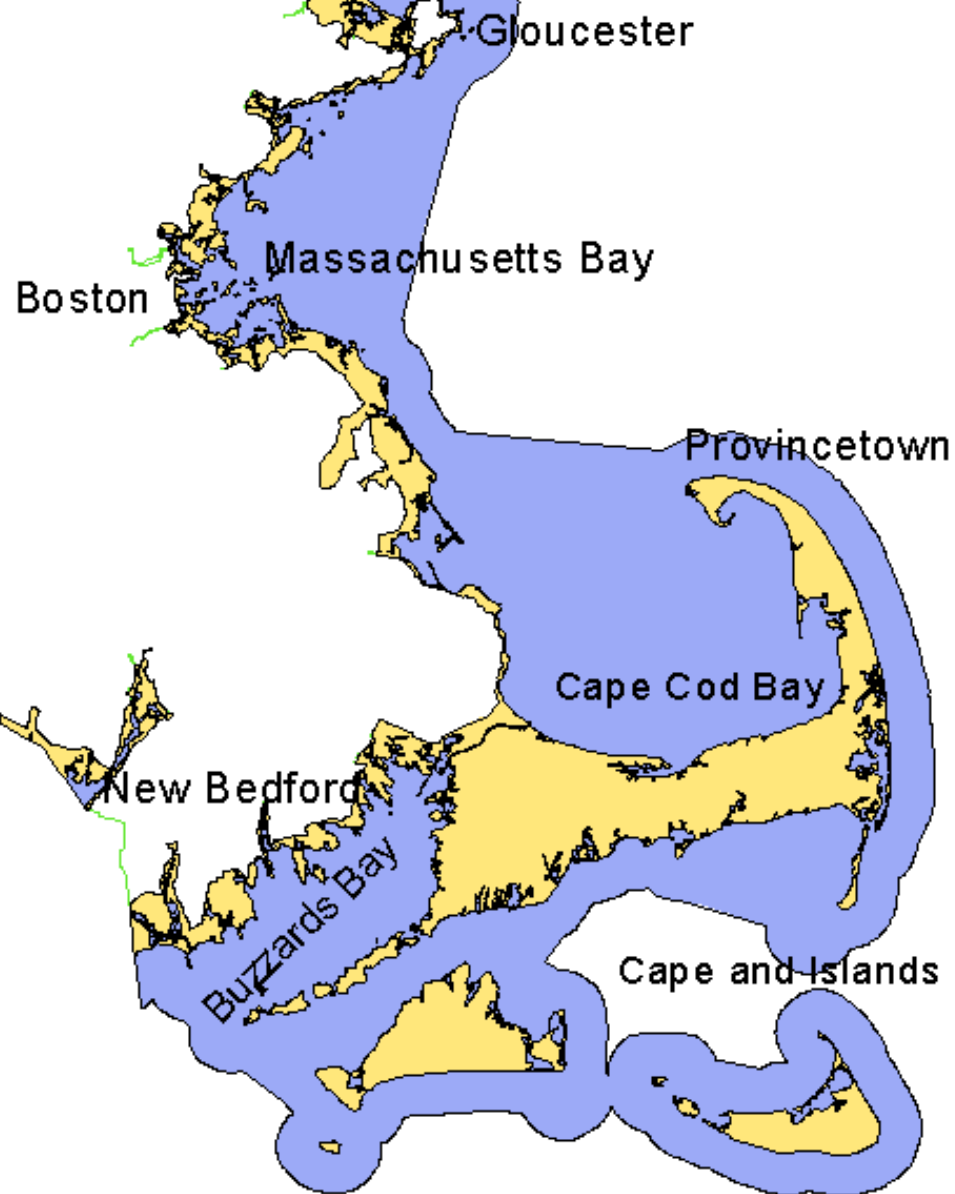
Massachusetts Ocean Management Workshop

July 30, 2003

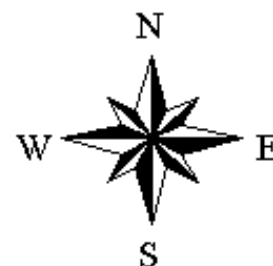
Moakley Federal Courthouse

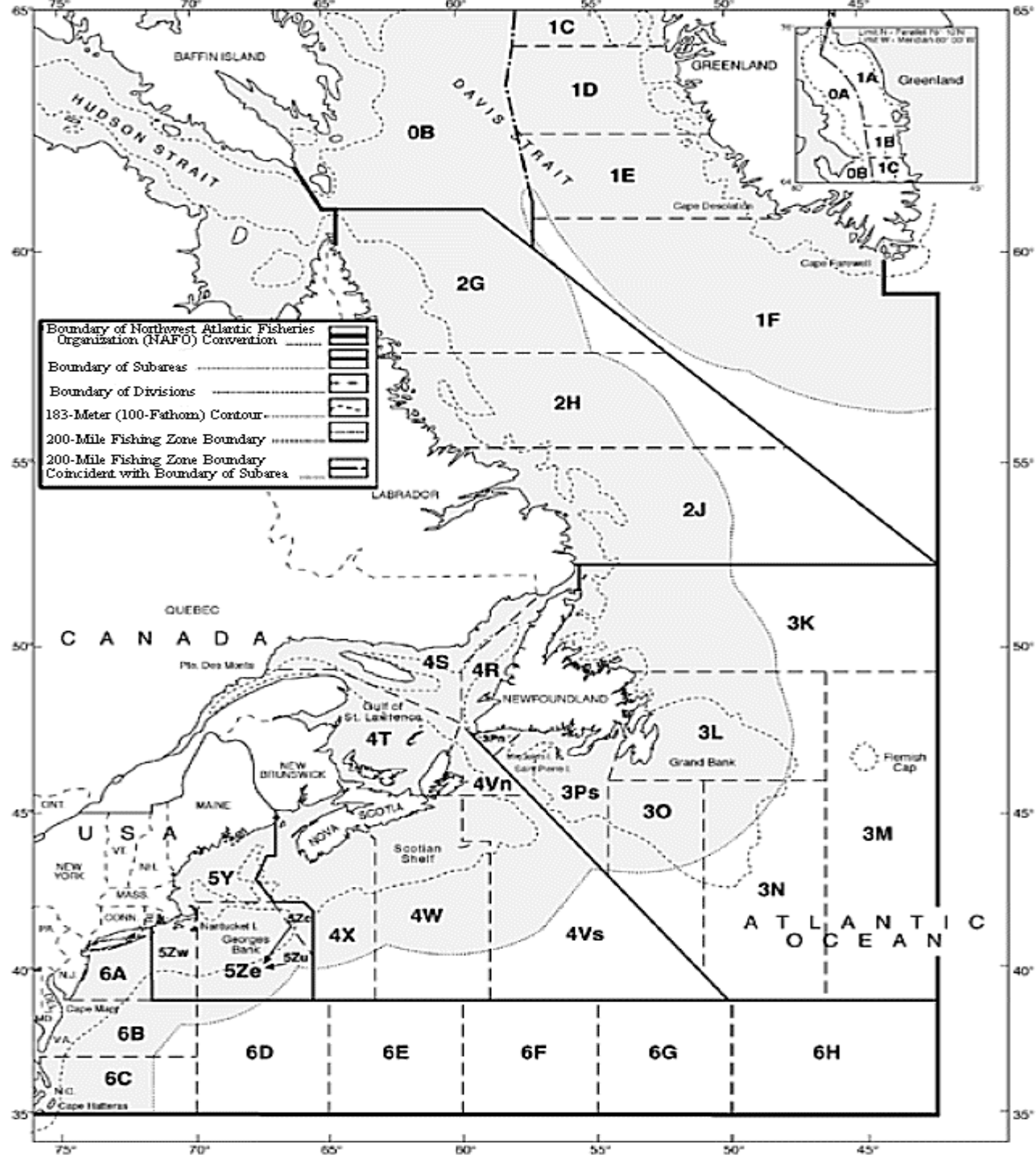


Massachusetts Ocean Resources



Coastal Zones
Lands of the CZ
Waters of the CZ
Mass. Outline





Circulation of Gulf of Maine and Georges Bank

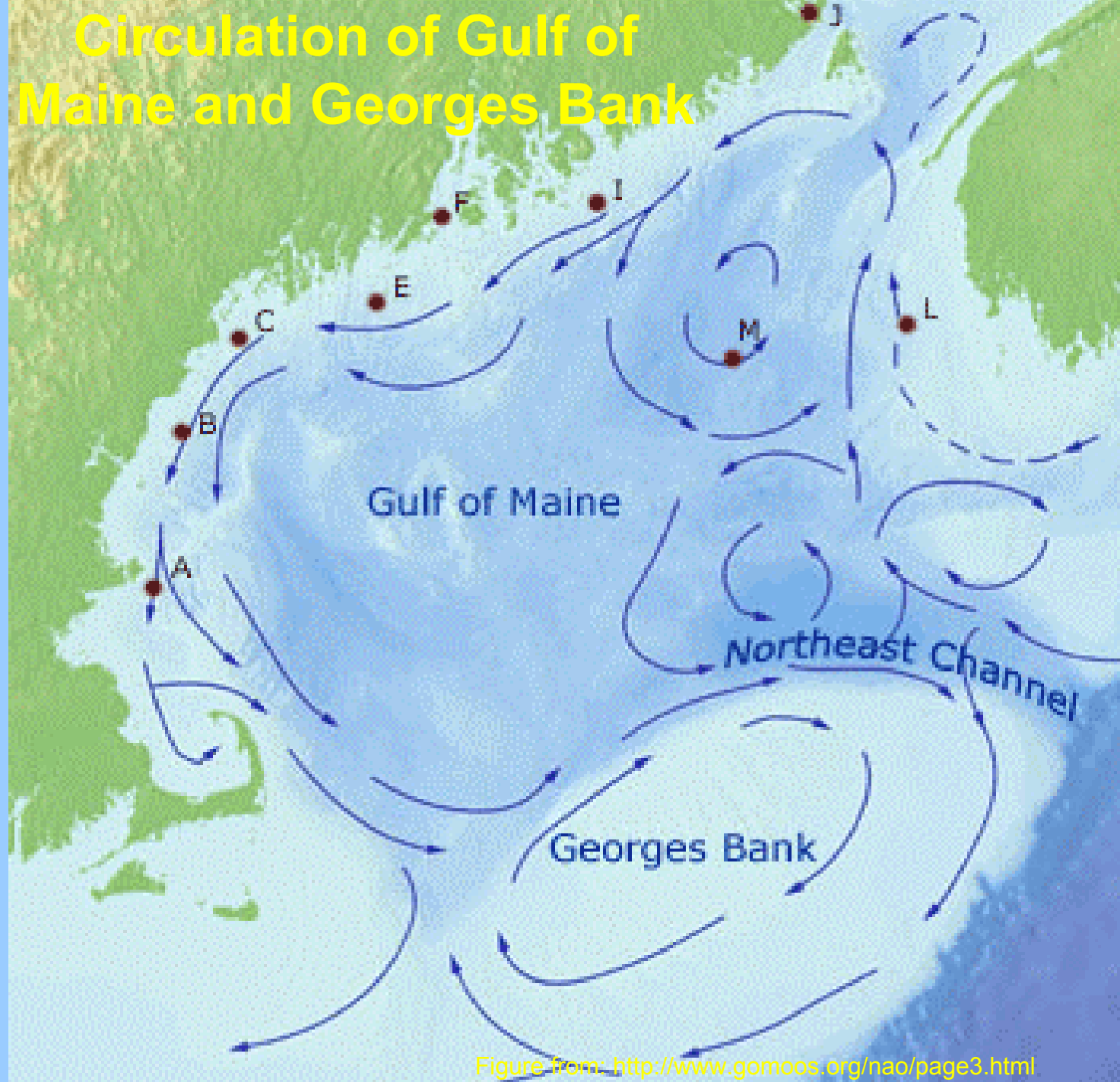
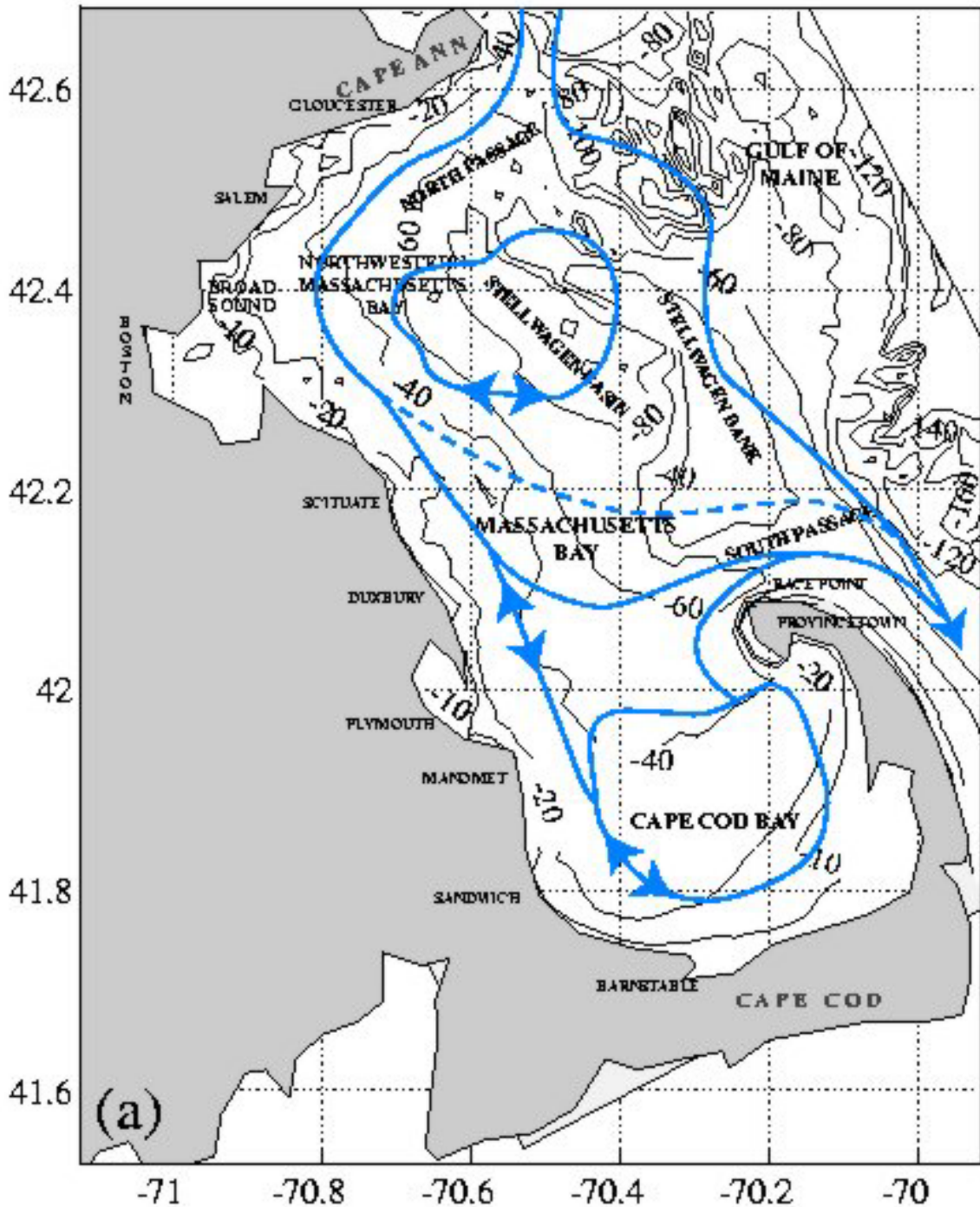
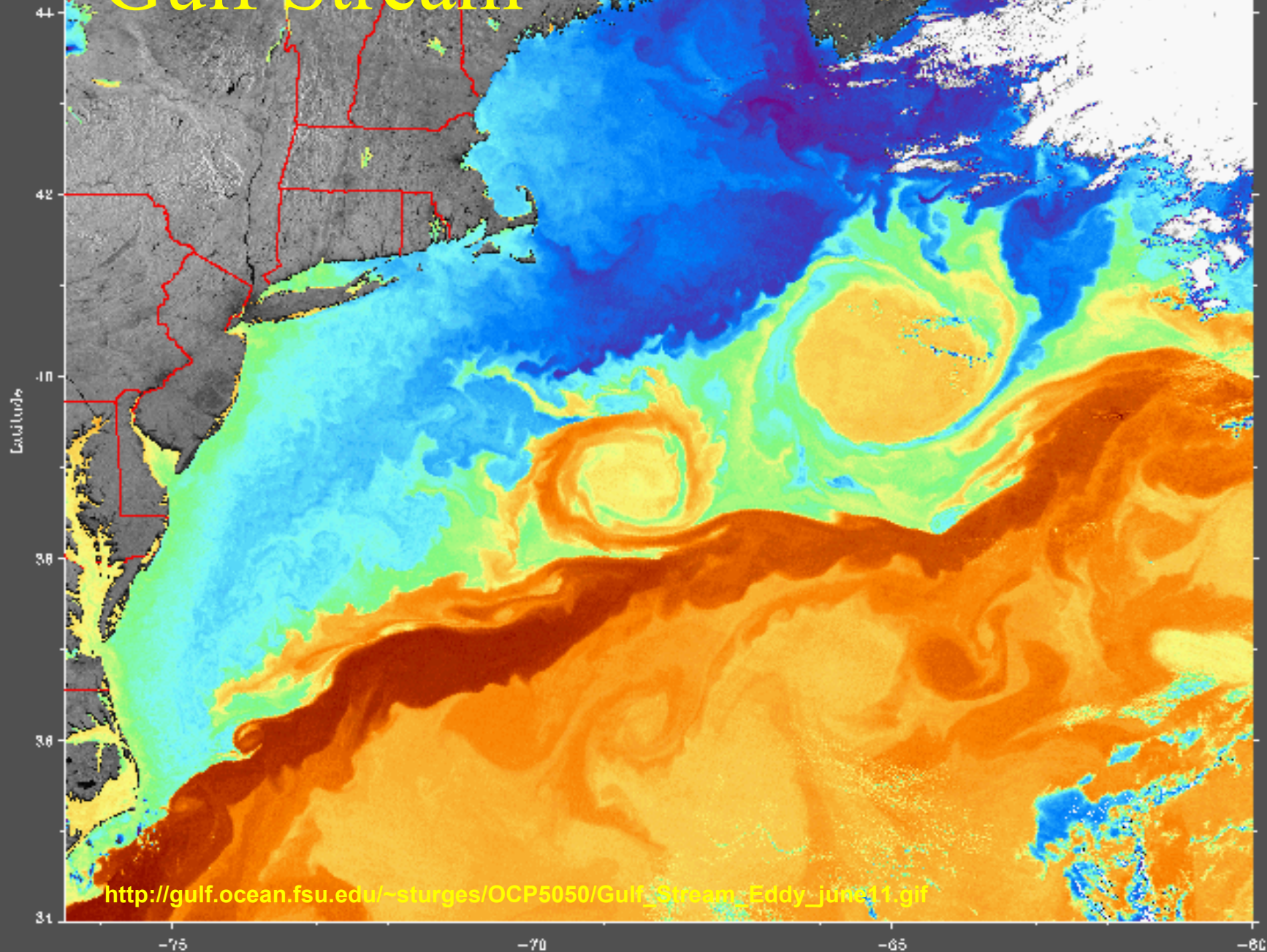


Figure from: <http://www.gomoos.org/nao/page3.html>

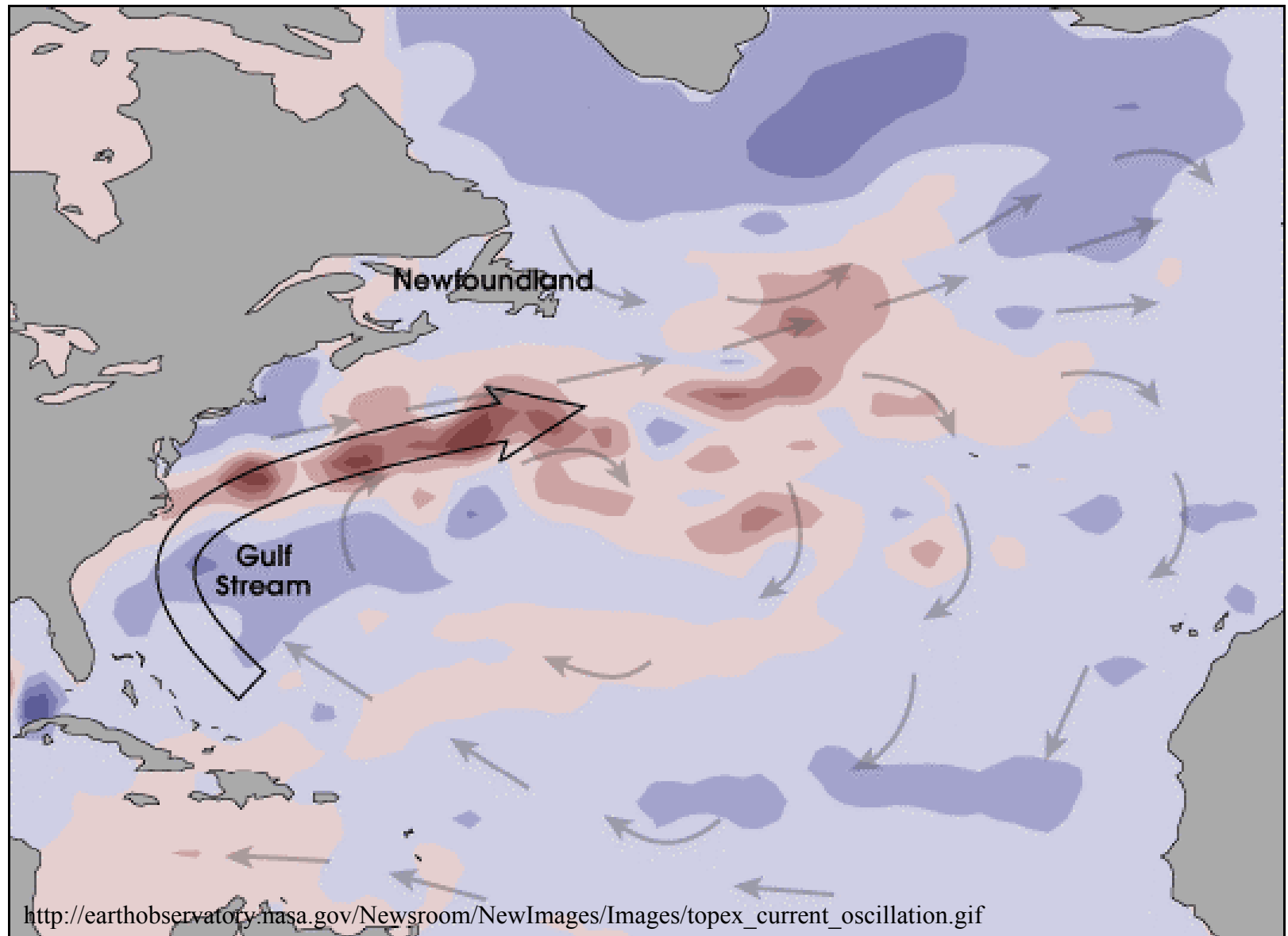
Massachusetts Bay Currents



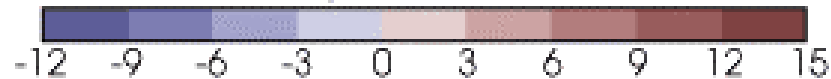
Gulf Stream



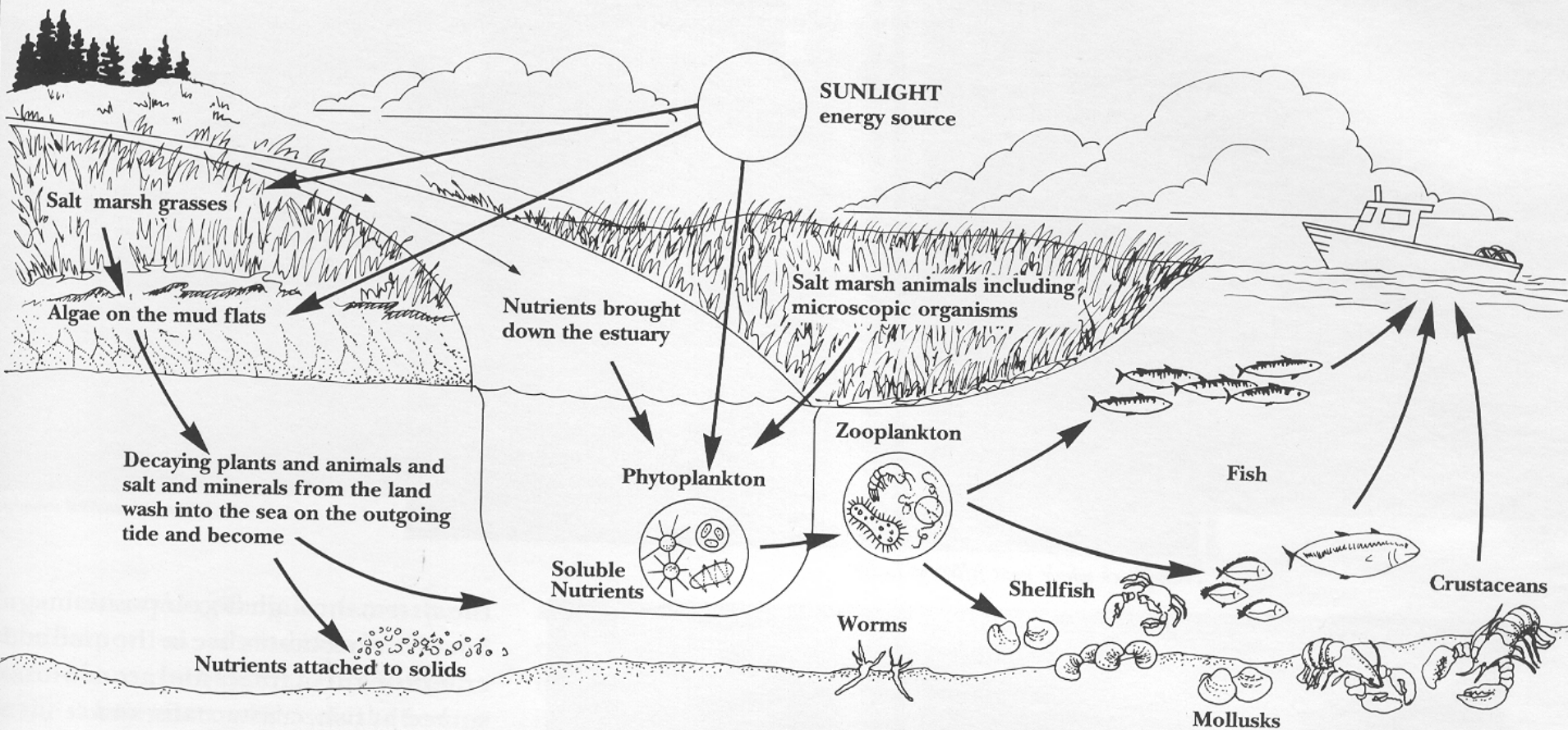
North Atlantic Oscillation



Change in Sea Level (cm)

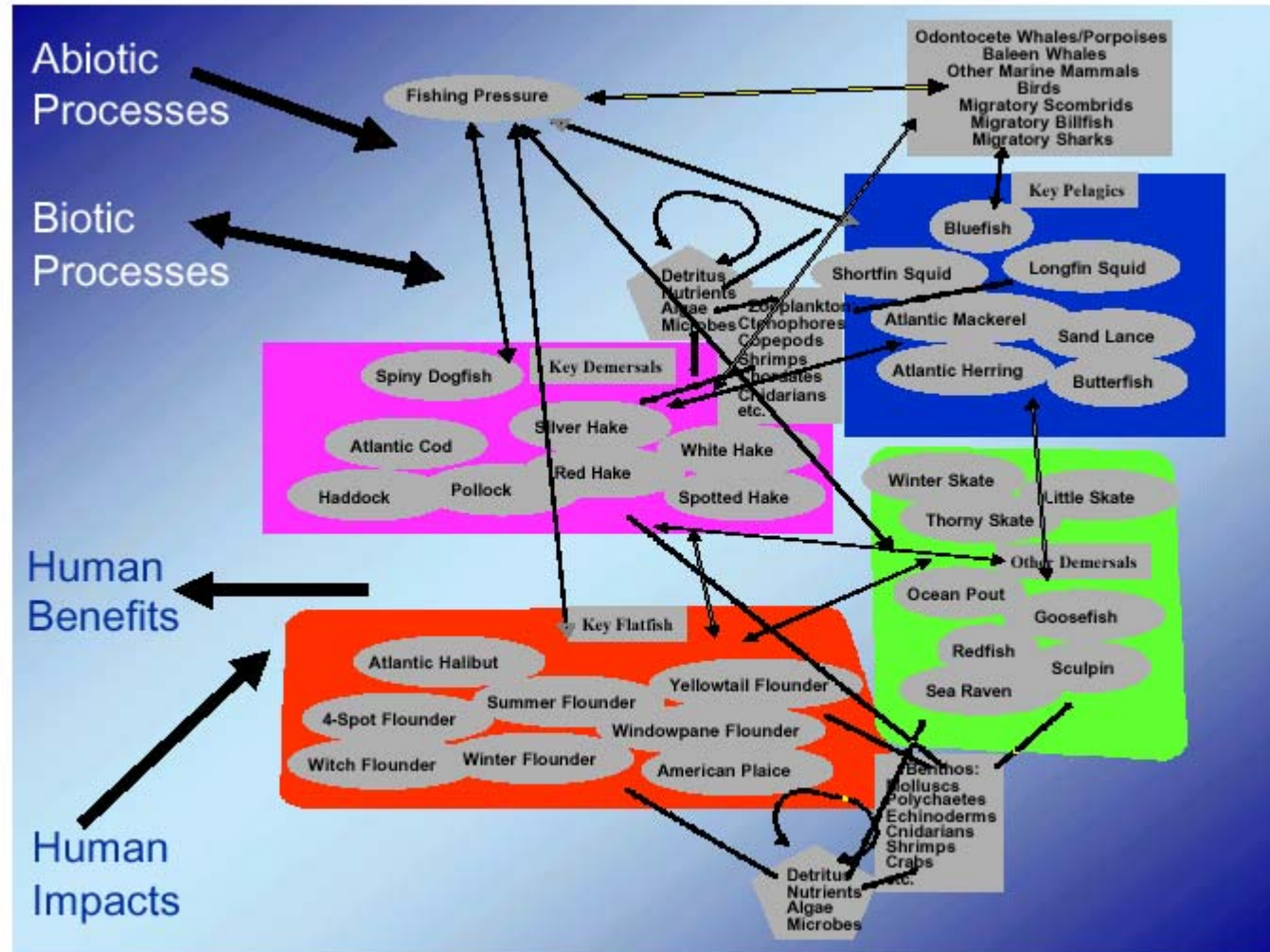


Energy Cycle and Food Web of Estuarine and Marine Systems



From Van Dusen and Hayden 1989

- Estuarine – river meets the sea
- Nearshore Marine – intertidal and subtidal habitats
- Offshore Benthic – subtidal habitats
- Offshore Pelagic – water column habitats



Estuarine Habitats and Inhabitants

Habitats (riparian corridor, tidal
marshes, seagrasses)

Function (migratory pathway, resident,
spawning and nursery)

Species (river herring, winter flounder)



Rocky Intertidal



Sandy Surf Zone



<http://www.nps.gov>

Nearshore Marine Intertidal Habitats

Mudflat



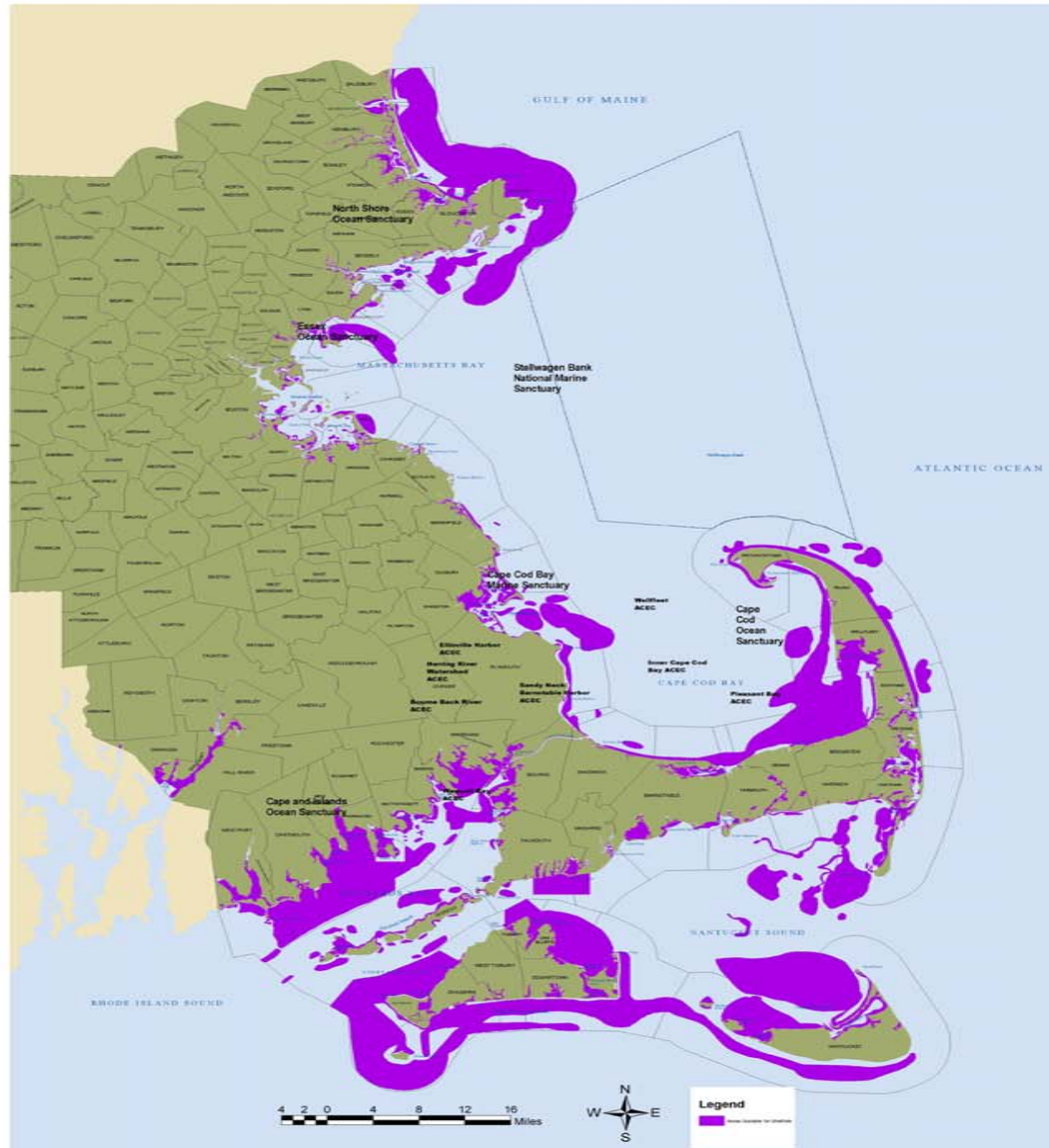
Dan Howard

Rocky Surf Zone

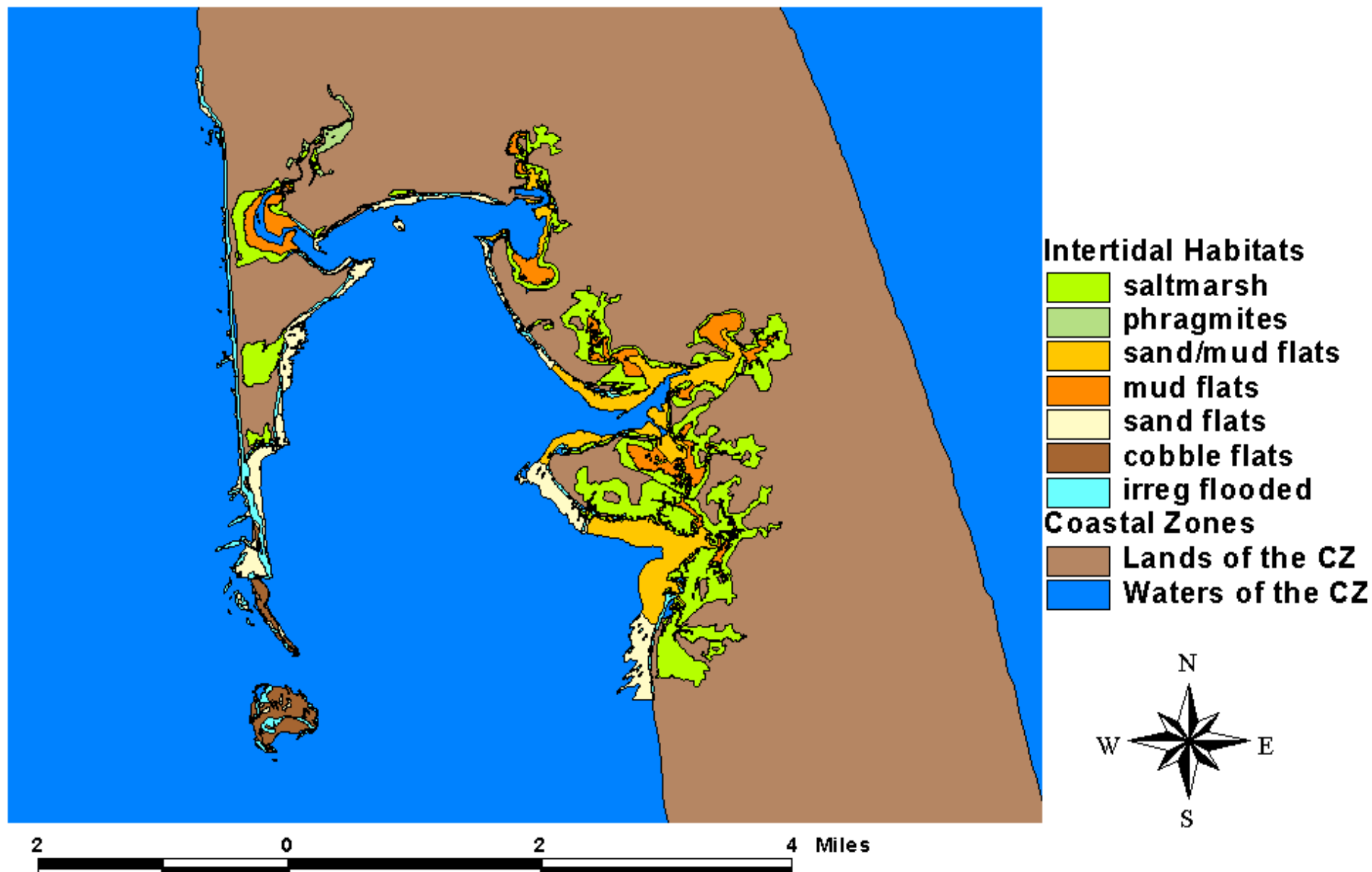


<http://www.uri.edu>

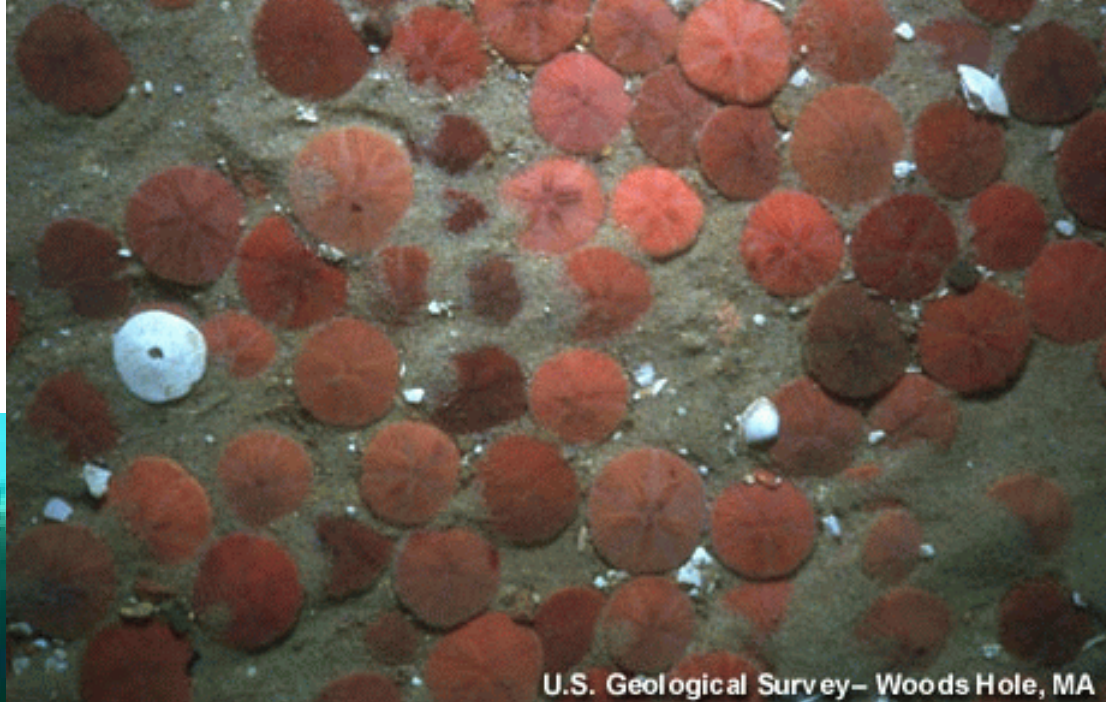
Shellfish Habitat



Wellfleet Harbor Intertidal Habitats



Nearshore Marine Subtidal Habitats and Inhabitants




U.S. Geological Survey– Woods Hole, MA



F. Short

State-Wide Seagrass Map





Nearshore Marine Habitats and Inhabitants

<http://www.users.zetnet.co.uk/papa-stour-sac/pics/kelp1s.jpg>

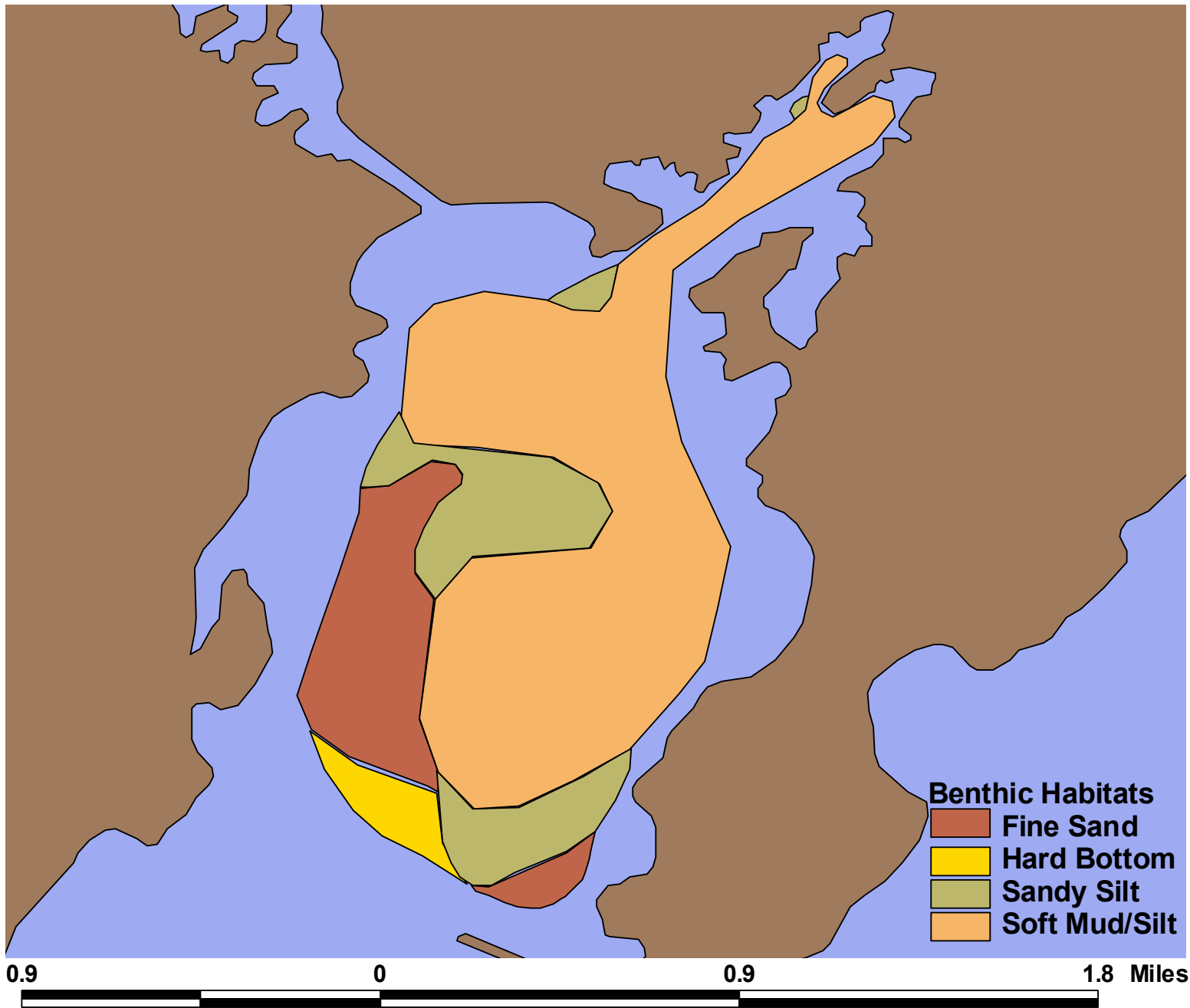


<http://www.bonnebay.mun.ca>



<http://www.pubs.usgs.gov>

Gloucester Harbor Benthic Habitats



Offshore & Nearshore Benthic Marine Habitats and Inhabitants

Sand

U.S. Geological Survey—Woods Hole, MA

Mud

USGS

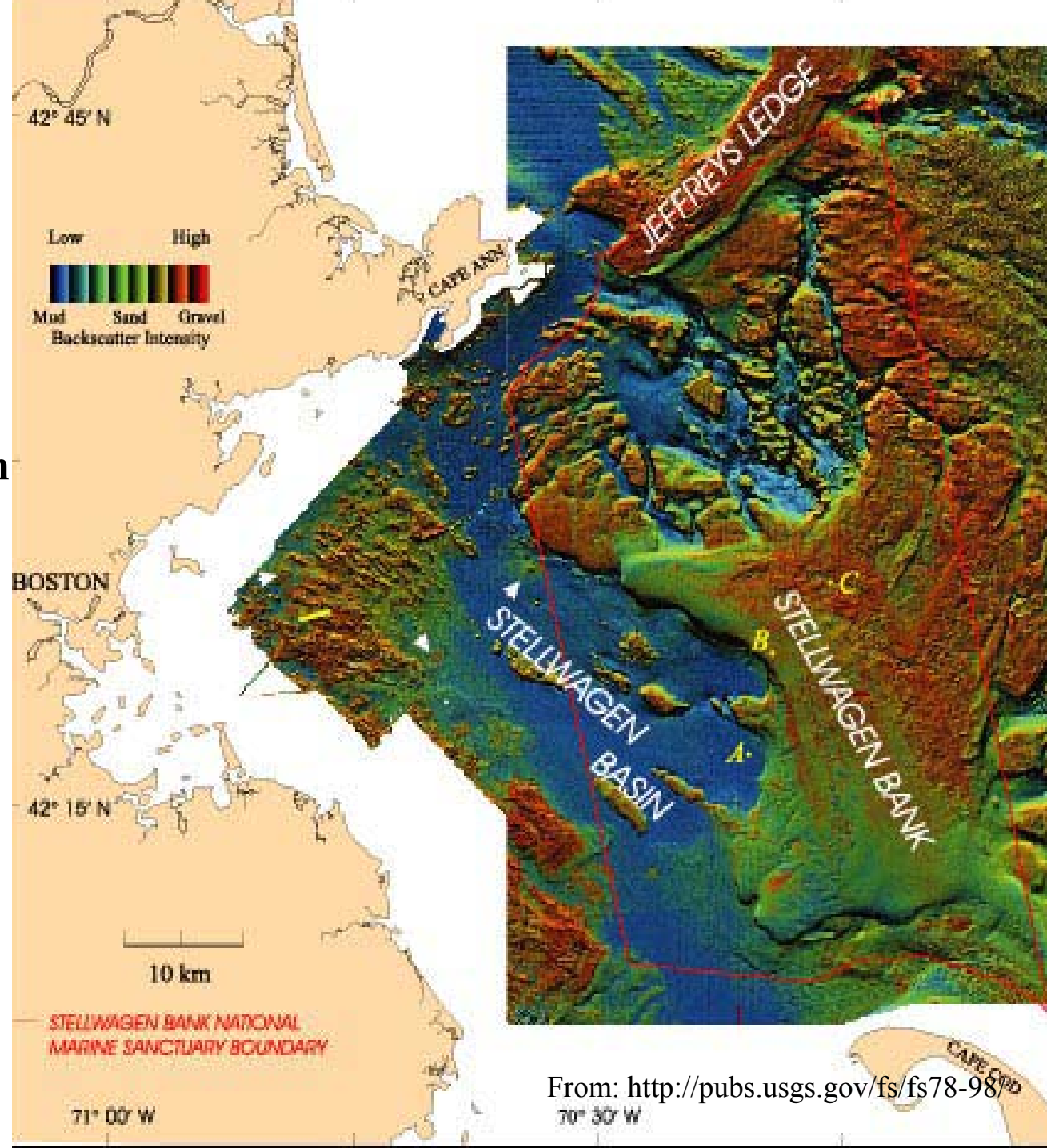
Boulder and Reef

Cobble and Gravel

USGS

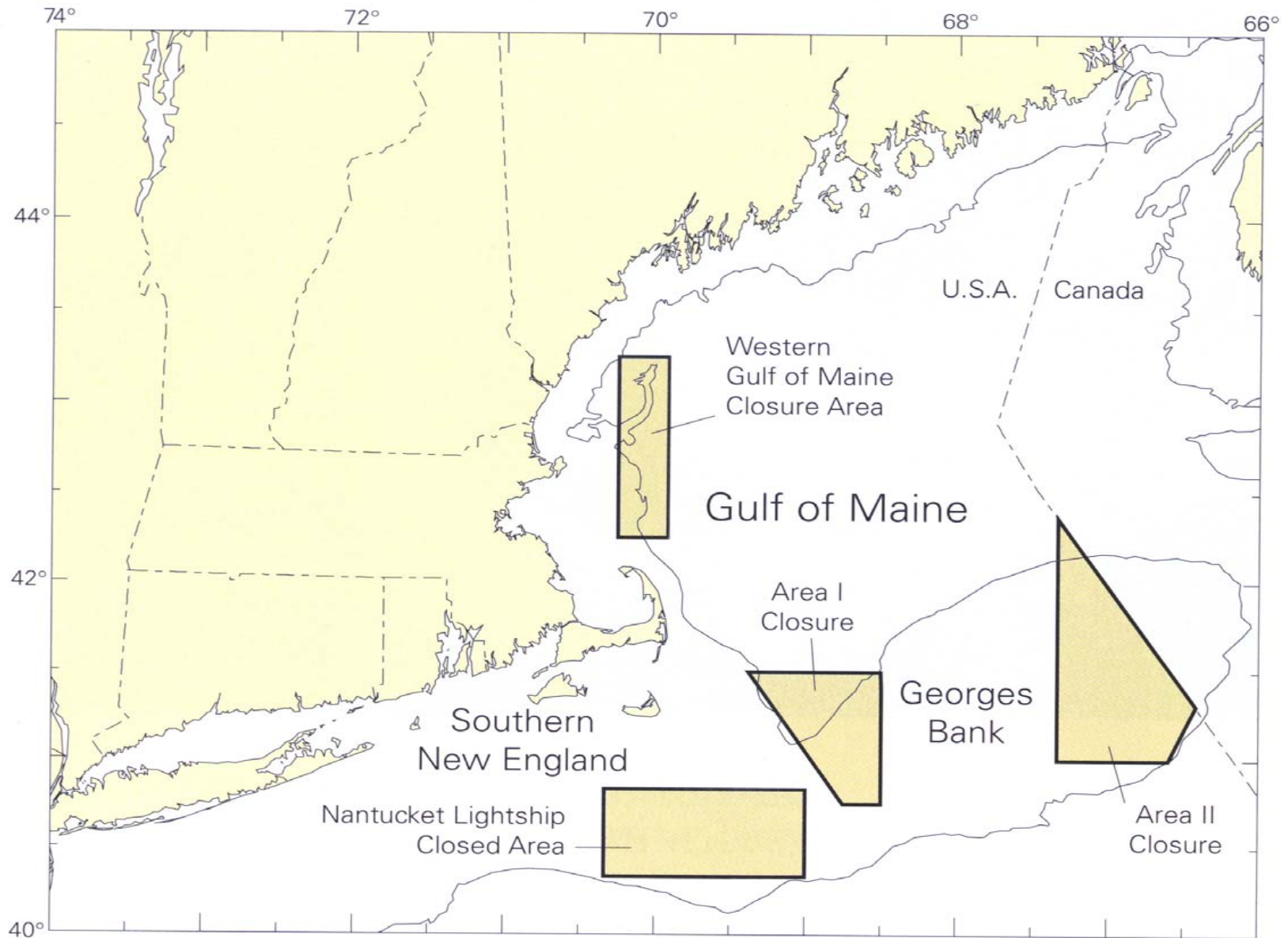
Offshore Benthic Marine Habitats

Example from Stellwagen Bank and Western Massachusetts Bay

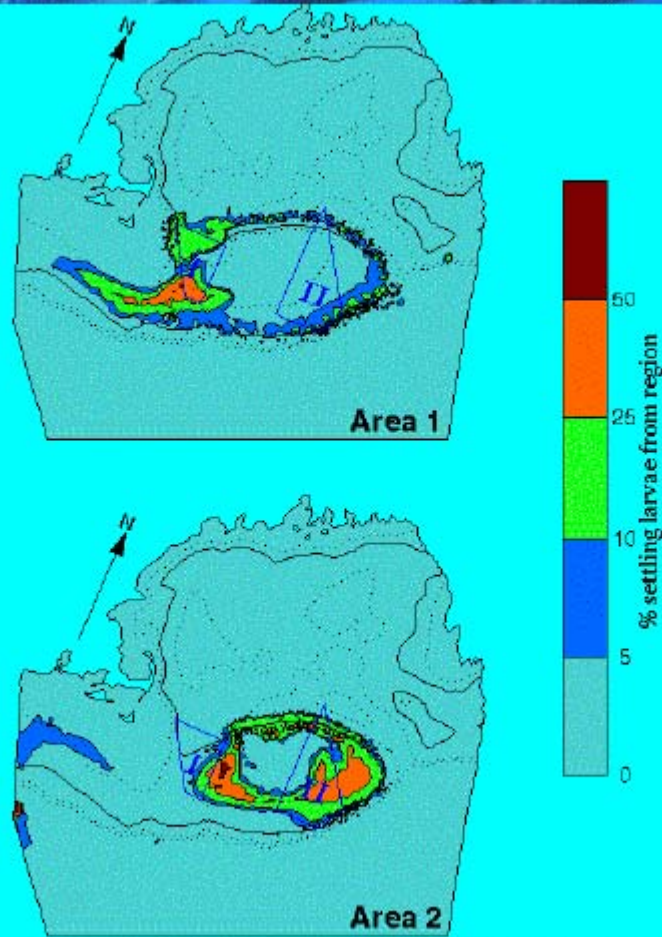


From: <http://pubs.usgs.gov/fs/fs78-98/>

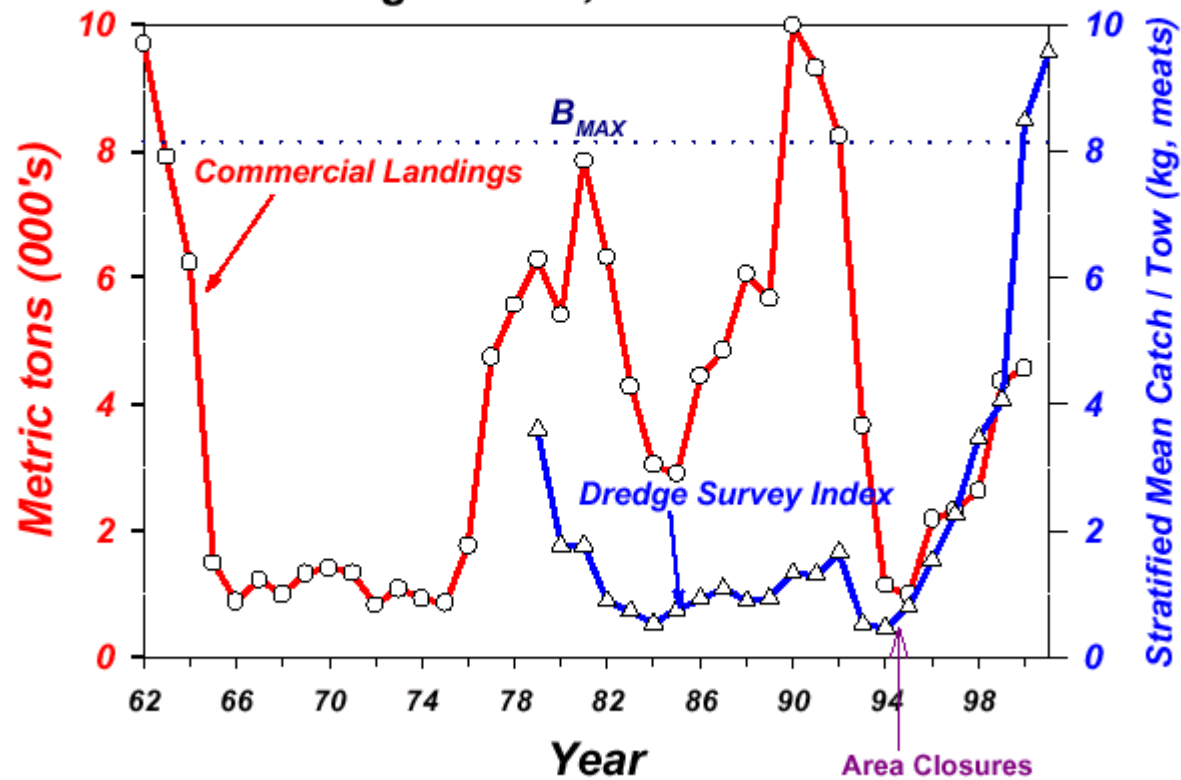
New England Groundfish Closed Areas



Distribution of settling larvae for regions I and II



Sea Scallop Georges Bank, USA Portion



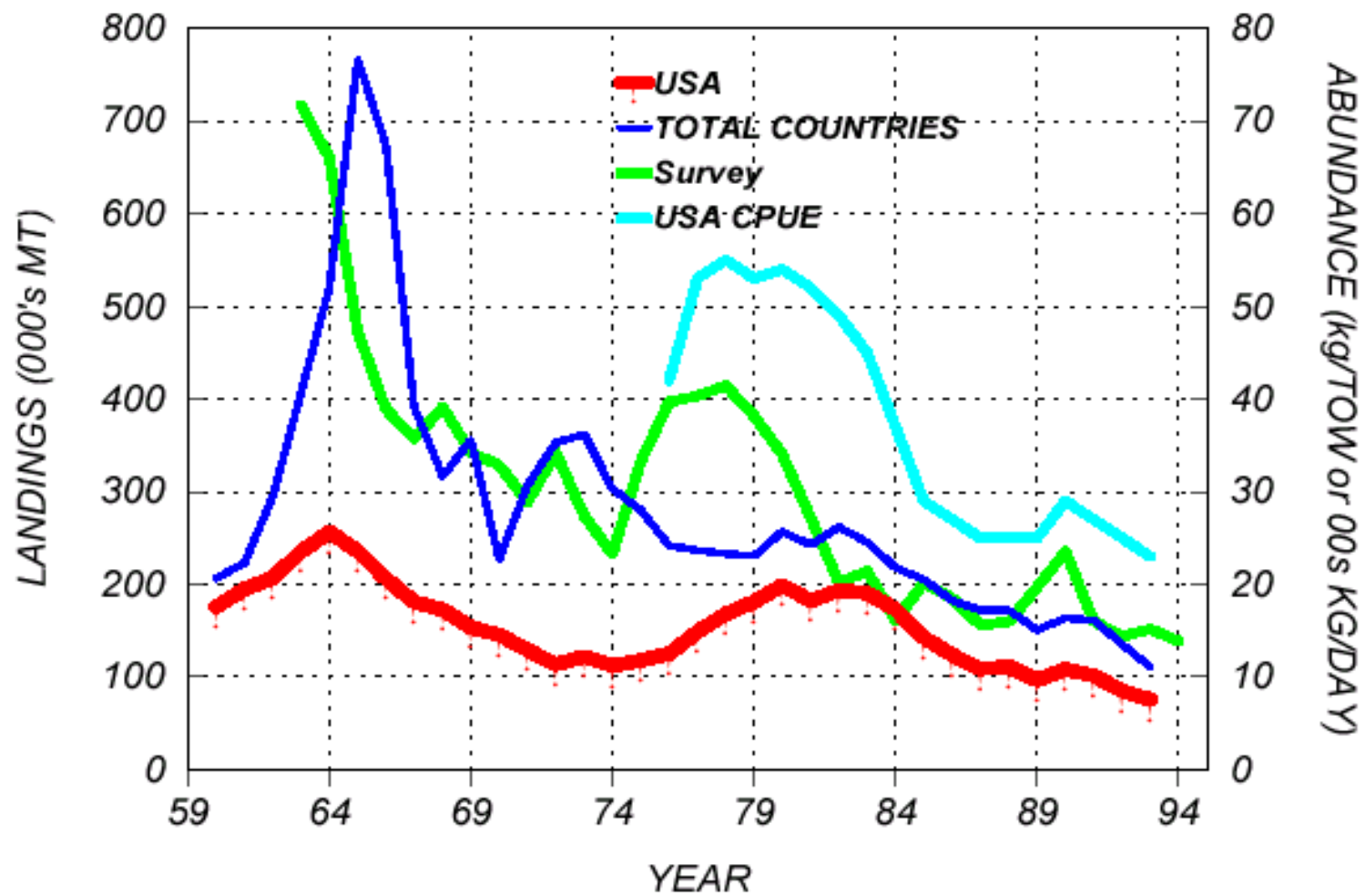


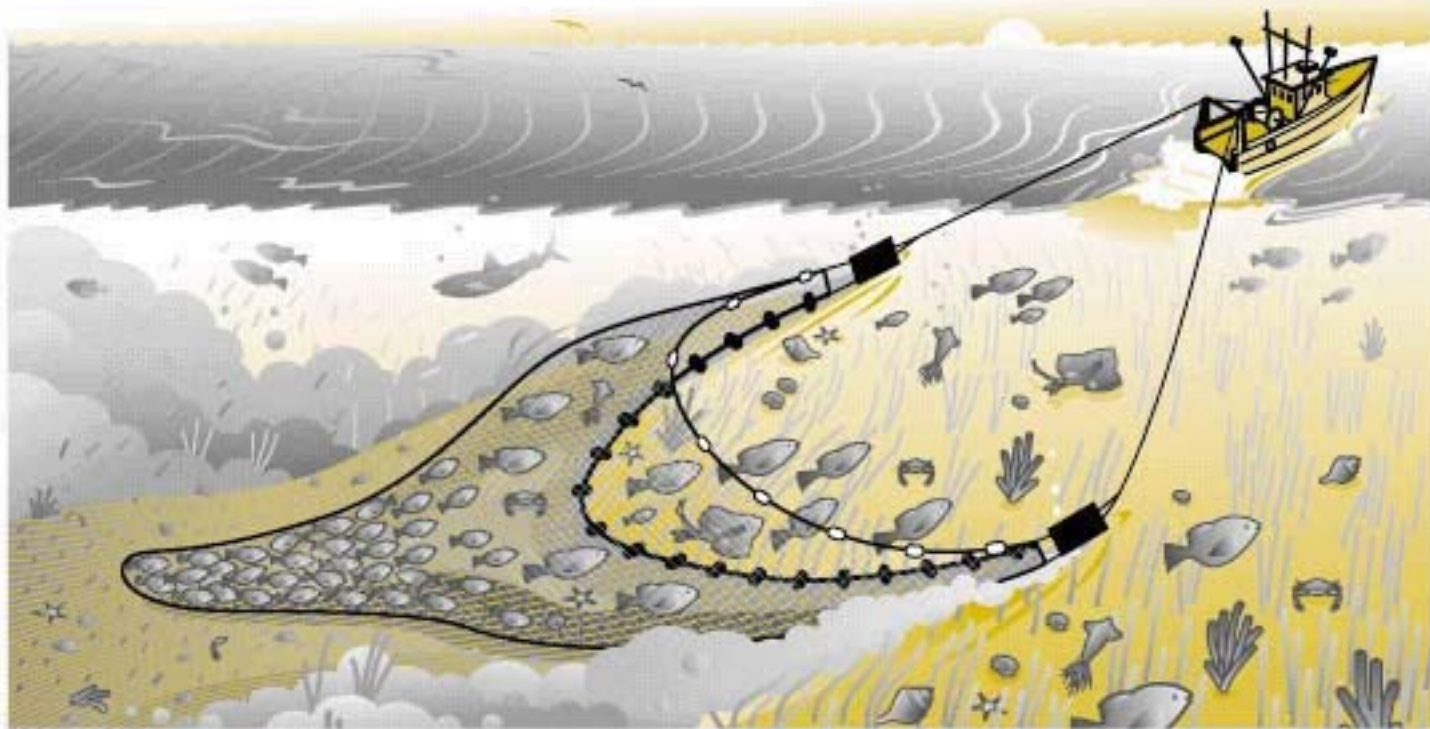
<http://www.state.ma.us/dfwele/dmf>



<http://www.state.ma.us/dfwele/dmf>

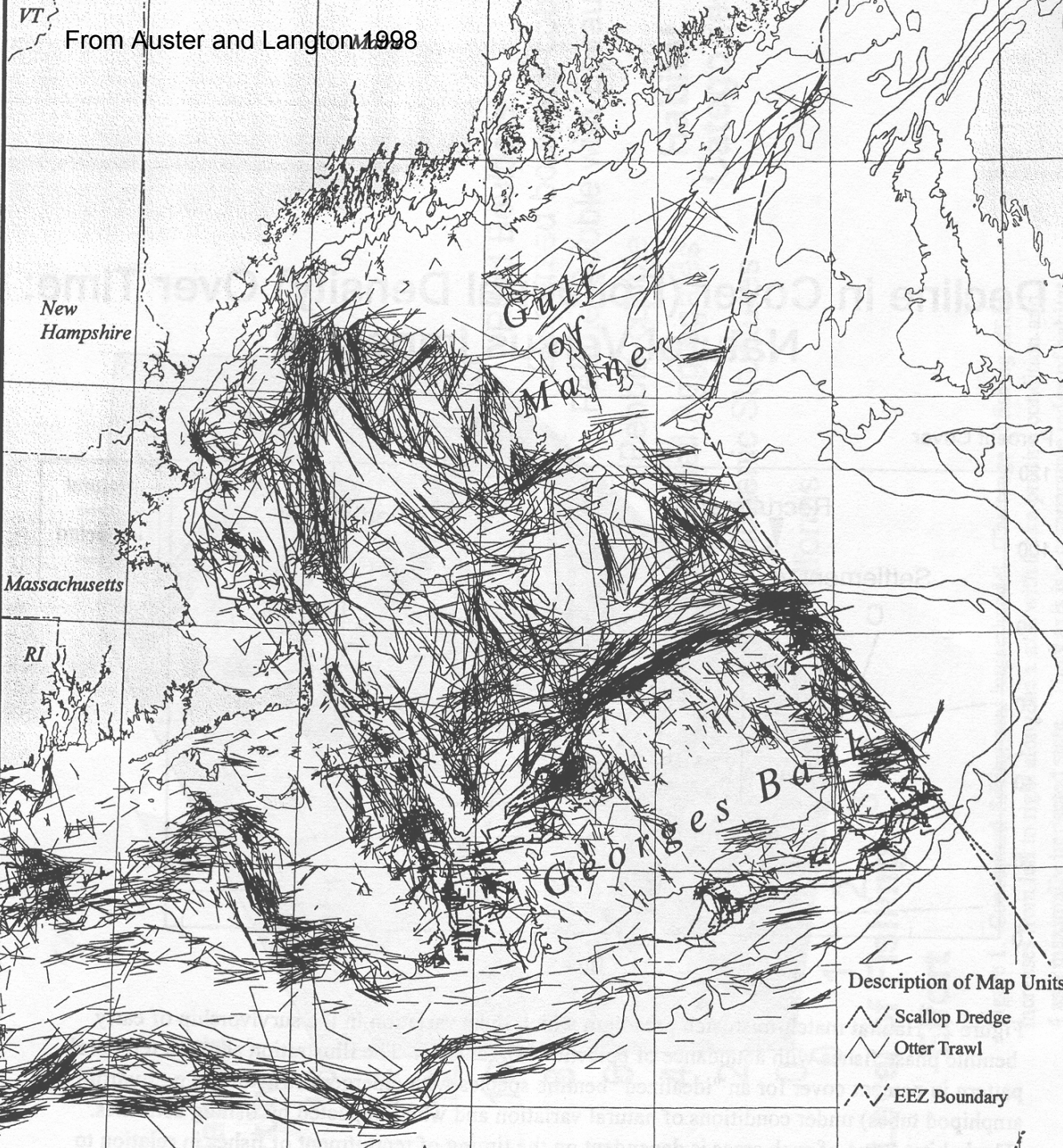
Groundfish Landings and Abundance 1960-1994





From Auster et al.

From Auster and Langton 1998



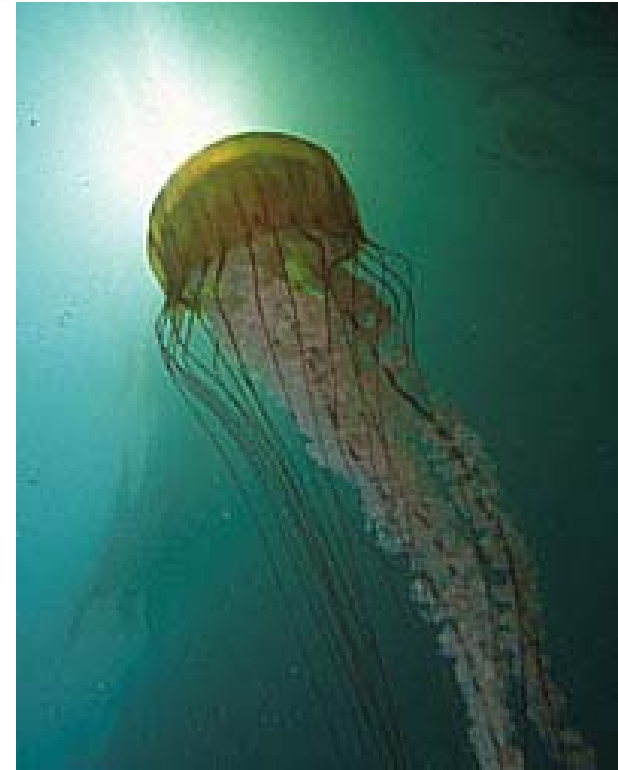
Commercial Fishing



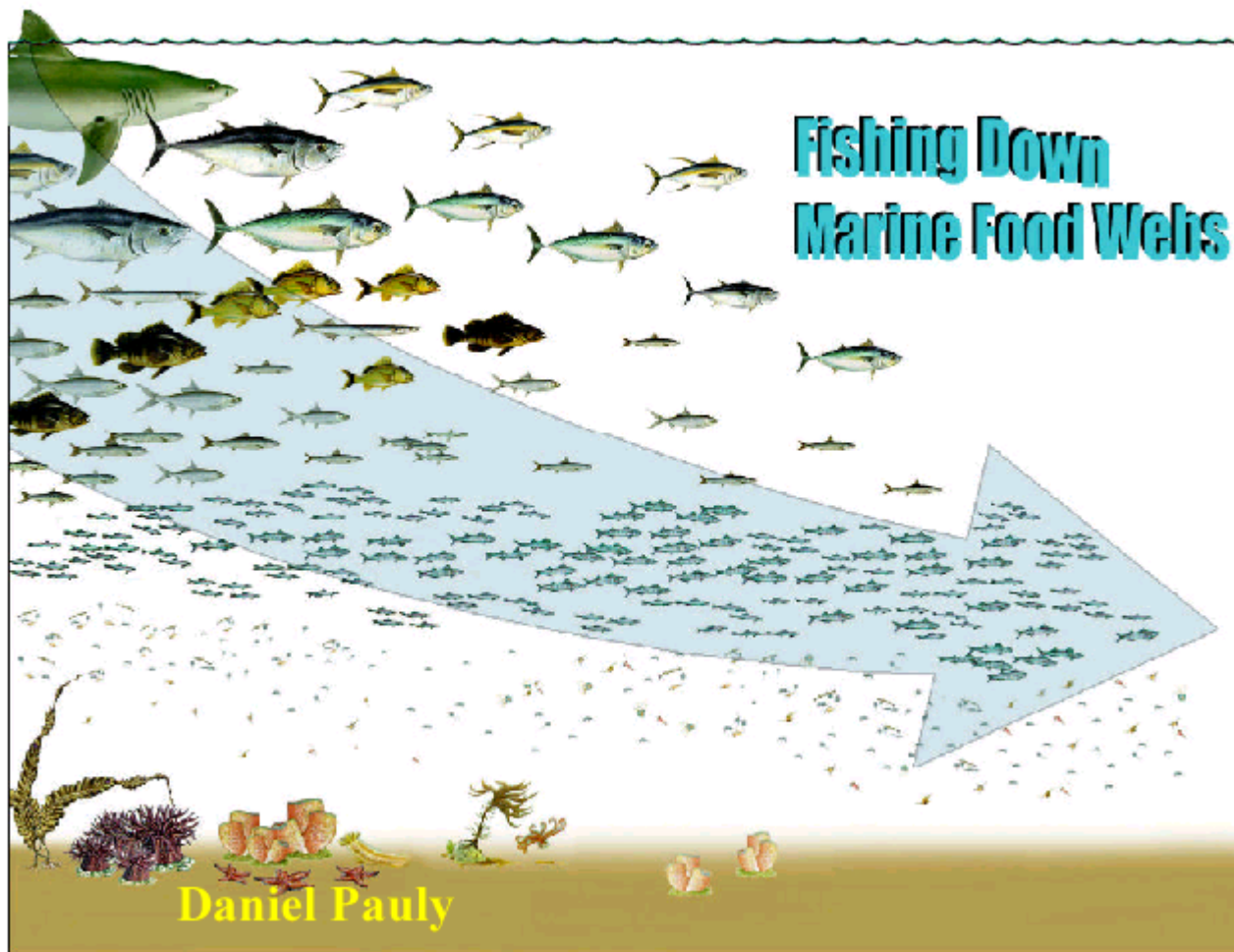
Offshore Pelagic Marine Habitats and Inhabitants

Species (large fishes, plankton,
whales, turtles)

Scale



Fishing Down Marine Food Webs



Daniel Pauly

Coastal Development



- Urban waterfronts; multi-use waters
- Cape Cod figures (land use change in past 20 years)

Massachusetts Ocean Resources

- Huge diversity in coastal Massachusetts
- The diversity is what keeps the system vibrant
- Ecosystem goods and services are at risk
- Huge changes over the last 30-50 years
- Overexploitation, pollution, coastal development are major ongoing problems
- Management measures are weak and late
- A change in ethic and action is needed and it is slow in coming

Characterization and Status of Massachusetts Ocean Resources

- Water and Sediment Quality, Judy Pederson
- Macroinvertebrates, Robert Buchsbaum
- Crustaceans, Bruce Estrella
- Fishes, Andy Rosenberg
 - Large Pelagics
- Marine Mammals, Birds and Turtles, Dave Wiley